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Alberta's
NORTHERN PIKE
Management and Recovery Plan

Alberta
ENVIRONMENT
Natural Resources Service

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Alberta's
NORTHERN PIKE
MANAGEMENT AND RECOVERY PLAN

David K. Berry
Provincial Recreational Fisheries Specialist

Keep fish in our future!

June 1999
Edmonton

Alberta Environment
Natural Resources Service
Fisheries and Wildlife Management Division

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PREFACE

The following document briefly summarizes information on Northern Pike in Alberta and outlines the management strategies that have been adopted. Companion documents will provide additional information on northern pike and describe operational plans for the management and recovery of specific populations. This plan is presented in a non-technical fashion to serve as public information; however, readers are encouraged to review scientific literature regarding this species.

Northern pike management strategies were developed and recommended by The Northern Pike Management Advisory Committee -- a group consisting of representatives of sportfishing organizations, the sportfishing industry, the academic community, commercial fishermen and the Fisheries and Wildlife Management Division. Public involvement in northern pike management and regulation development was accomplished through a multi-tiered format. Four steps were followed: 1) a public notice and questionnaire announcing the committee's intentions, 2) stakeholder workshops held in nine communities, 3) survey of anglers who wished to participate but were unable to attend a workshop, and 4) a follow up-survey of all participants to review draft recommendations. Alberta Environment, the Alberta Conservation Association and the Alberta Commercial Fishermen's Association provided funding in support of the public consultation process.

Appreciation for their involvement is extended to the more than 1100 Albertans who participated in the surveys and workshops, and to staff of the Alberta Fisheries and Wildlife Management Division throughout the province. Mike Sullivan (Alberta Environment) assisted the Committee by compiling information on northern pike based on extensive surveys of fish populations in the Northeast Boreal Region and pike populations from other areas of the province. Mike also made assessments of management strategies and regulation options, gave presentations at public workshops and was the chief advisor to the Committee. Dee Ryerson (Alberta Conservation Association) provided assistance to Mike. Dave Berry (Alberta Environment), and Dave Park and Natalie Cook (Alberta Conservation Association) acted as advisors to the committee. Jim Gendron and Bill McMillan, Equus Consulting Group Inc., designed and facilitated the public involvement program, conducted surveys, summarized questionnaire responses and prepared reports for the Committee.

The following provides the names and affiliation of the members of the Northern Pike Management Advisory Committee:
- Hugh Norris--Chairperson (Alberta Environment)
- Vance Buchwald (Alberta Environment)
- Gord Caudron (Commercial Fisherman)
- Tom Heisler (Western Walleye Council)
- Dave Johnston (Alberta Sport Fishing Industry Association)
- Bill Mackay—*Professor Emeritus* (W.C.MacKay and Associates)
- Dave McArthur (Alberta Commercial Fishermen's Association)
- Vern McIntosh (Alberta Fish and Game Association)
- Ken Parsons (Summer Village Administrator)
- Duane Radford (Alberta Environment)
- Marty Stevens (Janmar and Sons Boat Rentals)
- Dave Walty (Alberta Environment)

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EXECUTIVE SUMMARY

Alberta's Northern Pike Management and Recovery Plan is based on the goals, objectives and guiding principles presented in the document *A Fish Conservation Strategy for Alberta* (Fisheries Management Division 1997). The overall goal of the pike management and recovery plan is:

"To sustain the abundance, distribution and diversity of natural reproducing northern pike populations and provide domestic, recreational, commercial and economic benefits to Albertans."

Conservation includes two components: 1) protection which ensures the perpetuation of abundant fish populations, and 2) the appropriate use of only the surplus that is not required for population maintenance. Overharvests have been a major cause of declines in the number and size of northern pike. However, conservation of fish resources can not be achieved through control of fish harvest alone--habitat maintenance is essential.

Three components of the above goal are:

HABITAT MAINTENANCE – Restore and maintain the natural productive capacity of northern pike habitat, and where possible and appropriate, increase the amount of productive northern pike habitat.

FISH CONSERVATION – Restore and maintain the abundance, distribution and diversity of northern pike populations through natural reproduction, and regulate pike harvest in line with, and not exceeding, the productive capacity of pike populations.

FISH-USE ALLOCATION – Allocate the appropriate uses of the northern pike resources to achieve a range of optimal benefits, and manage pike populations in a manner that meets the present needs of Albertans without compromising the ability of future generations to meet their needs.

The Northern Pike Management Advisory Committee developed a biologically sound and socially acceptable framework of objectives, strategies and actions to achieve the above goal. The Committee adopted lake-by-lake management based on the status of the recreational fishery. Emphasizes was placed on the regulation of sportfishing because of the impact of this form of recreation on the resource. Fisheries managers throughout the province, on an ongoing basis and with local stakeholder consultation, will assess and classify the pike population at each water body, and assign them into the following status categories:

Stable – a healthy pike population that allows for opportunities to catch pike in a range of sizes. Fishing is generally good throughout the water body. Stable populations are managed to sustain healthy populations, using regulatory actions for "moderate harvest," provided a harvest does not result in population decline. The stable category is further classified into three sub-categories providing for a variety of angling experiences:

- Stable-Recreational Fishery – managed to provide good catch rates of pike, but not necessarily large fish.
- Stable-Quality Fishery – managed to provide pike of a medium size, over 70 cm total length (2 to 4 kg), although fewer pike can be kept.
- Stable-Trophy Fishery – managed to provide pike of a large size, over 100 cm total length (> 9 kg), although fewer fish can be produced.

Vulnerable – a pike population with low numbers of adult pike and reasonably abundant small pike, but low to moderate catch rates (fish/hour). Vulnerable populations are managed to promote population recovery to stable recreational fisheries, using regulatory actions for "minor harvest," provided the primary emphasis upon conservation is not compromised.

Collapsed – a pike population with undesirable low numbers of adult and younger fish. Collapsed populations are managed to promote population recovery to stable recreational fisheries, using regulatory actions for "no harvest."

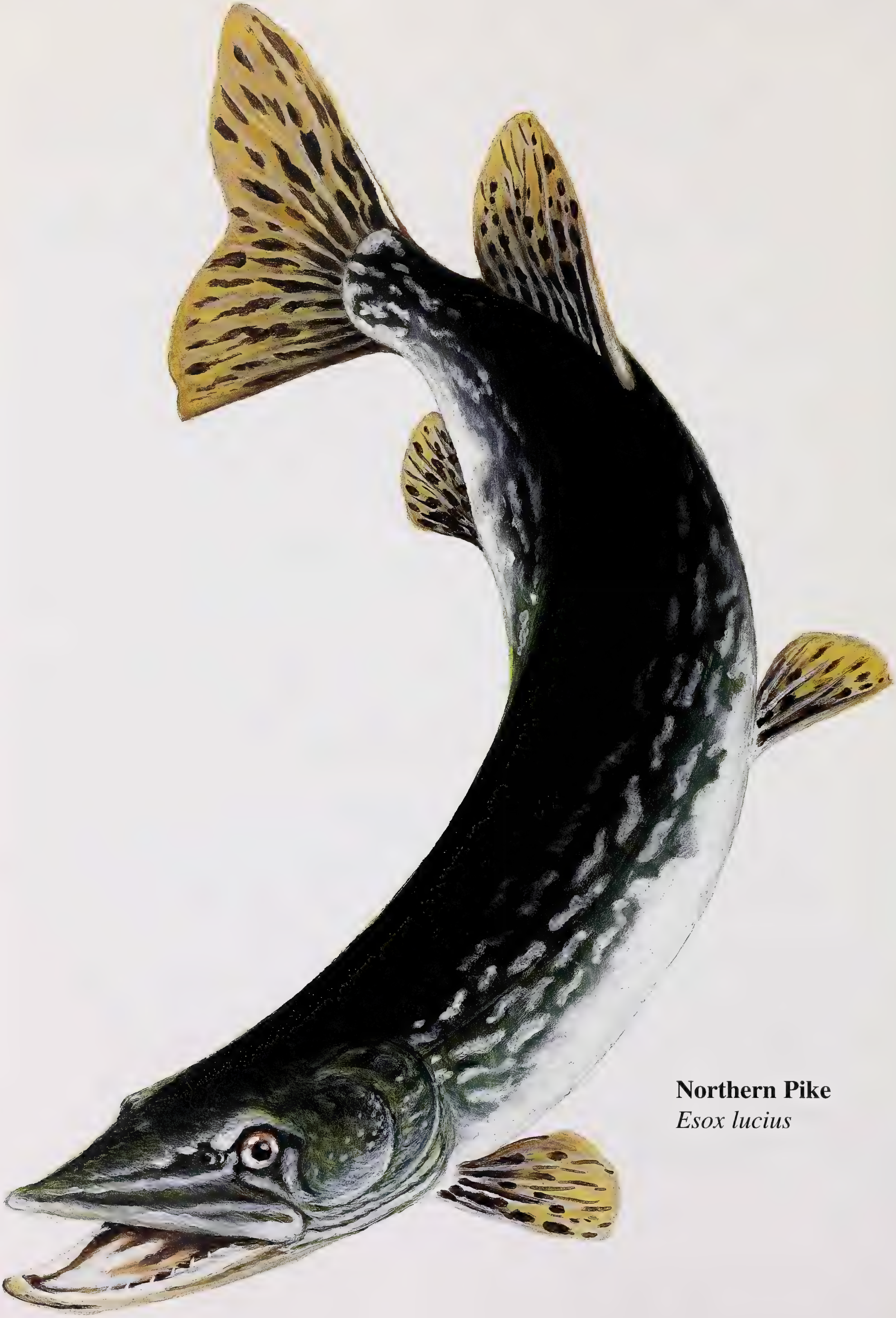
Special Circumstances – a pike population in a water body where there is limited capability to sustain a stable population because of habitat limitations (e.g., frequent winterkills, stunted growth, or marginal spawning areas). This category also includes locations where pike are not a desirable species (e.g., trout streams or trout stocked ponds).

In the future, the majority of pike populations will be managed as stable-recreational fisheries; however, recovery efforts are currently required to restore collapsed and vulnerable fisheries to stable-recreational fisheries. Some pike populations, based on lake-specific management planning, will be specially regulated to provide quality or trophy fisheries with larger fish.

Changes to sportfishing regulation for northern pike commenced on April 1, 1999, and on an ongoing basis, further adjustments to regulations at site-specific locations will be implemented where information indicates that changes are appropriate (detailed regulations are published annually in the Alberta Guide to Sportfishing Regulations).

New catch limit and size limit changes will phase in. In 1999, a province-wide limit of 3 pike over 63 cm total length has been implemented. Water body specific exceptions occur at most trout streams, at trout stocked ponds and at a few lakes managed under special circumstances. Starting in 2000, lake-by-lake regulations for pike will be implemented. As required, exceptions to the province-wide limit will be set at 2, 1, or 0, along with special size limits, to meet specific management needs, using the following guidelines:

- Stable Recreational Fisheries - The majority of pike populations will be managed as stable-recreational fisheries to provide good catches of pike, but not necessarily large fish. These locations would have a limit of 1 to 3 pike over 63 cm depending on fishing pressure.
- Stable Quality Fisheries - Some pike populations may be selected as quality fisheries managed to provide pike of medium size, over 70 cm (2 to 4 kg), but not necessarily in large numbers. At these locations the limit would be 1 to 3 pike over 70 cm.
- Stable Trophy Fisheries - Some pike populations may be selected as trophy pike fisheries managed to provide pike of large size, over 100 cm (9 kg), but not necessarily in large numbers. One option is 1 pike over 100 cm and possibly 1 to 2 under 63 cm, depending on fishing pressure.
- Vulnerable and collapsed pike populations will be managed to promote population recovery to stable recreational fisheries. At these locations the limits will be 1 pike over 63 cm for vulnerable and 0-limit (catch-and-release only) for collapsed.
- Under special circumstances no size limit will apply to the pike limit. For examples, at trout stocked ponds and trout streams containing pike, and at a few lakes where there is limited capability to sustain a stable pike population because of natural habitat limitations. Also, at some remote lakes, fishing pressure may still be light enough to not require size limit restrictions. At these locations the regulation would be 1 to 3 pike (no size limit).



Northern Pike
Esox lucius

1.0 SPECIES OVERVIEW

1.1 Classification and Description

The northern pike (*Esox lucius*) is the only member of the pike family found in Alberta; however, it is related to the muskellunge, chain pickerel, redfin pickerel and grass pickerel, which are members of the pike family found in eastern Canada. Although northern pike is the most accepted common name for the species, other common names include 'pike', 'great northern pike', 'jackfish', 'jacks', and the less polite terms 'hammer handles', 'slough sharks' and 'slimy snakes'. The later terms may imply disdain held by some anglers for small pike, particularly from warm, shallow waters, but these terms are also used in jest. The northern pike is highly prized by the vast majority of anglers and the species is the mainstay of the sportfishery throughout Alberta.

Northern pike are known for their powerful jaws and well-developed teeth, and easily recognized by the flattened mouth portion of the head (like a duck's bill). Their exceptionally large mouth is distinctly suited for preying on smaller fish. The pike's body is torpedo-shaped and covered with small scales. Its tail is broad and moderately forked. A single, soft-rayed dorsal fin is located far back on the pike's body above the anal fin.

The basic colour pattern on northern pike consists of light markings on a dark background; however, some variation in the pattern is common. The typical pattern on juveniles consists of wavy, vertical bars on the sides. In adults, the distinct vertical bars disappear and the pattern changes to rows of bean-shaped spots. The dark colouration along the back, ranging from a brilliant green to greenish-brown, extends onto the head and blends down the sides to a light colouration covered with yellowish-white bars or spots. A tiny gold spot on the tip of most scales gives the body the appearance of being flecked with gold. The belly is cream or yellowish-white. The dorsal, anal and caudal fins are greenish-yellow to reddish-orange with large, irregular black markings. A mutant form of pike, sometimes referred to as a 'silver pike' because of its metallic green to bright silver colour and lack of markings, occasionally occurs in some populations.

A taxonomic history of the northern pike can be found in *The Fishes of Alberta (*Nelson and Paetz 1992*).*

1.2 Biology

The northern pike is considered a cool-water species in contrast to trout, which are cold-water species. Although pike occupy a wide range of habitats, they prefer moderately fertile lakes (termed mesotrophic) to very fertile lakes (eutrophic). Deep, cold, infertile lakes (oligotrophic) are less suitable. Warm, relatively slow, vegetated rivers generally support pike populations.

Most pike spend the majority of their time close to shore in shallow, weedy areas (littoral zone), moving into deeper waters only during unusually hot periods or to spend a portion of the winter. Individuals tend to occupy the same general area for long periods without moving significant distances. Only on occasion have individuals been recaptured great distances from the location where they were tagged. Unlike some species, northern pike do not typically undertake long journeys on spawning migrations.

In Alberta pike populations, males can reach maturity at age three, at about 33 cm in total length[1]. Females can reach maturity at age four, at about in 43 cm total length. These young ages of maturity are typical of heavily fished populations. Between 50 to 60 cm total length is a healthier size range for pike to reach maturity.

The number of eggs produced increases with the size of the female, being about 20 to 30 thousand eggs/kg of fish weight. A 56 cm female produces about 20,000 eggs and a 105 cm female produces about 140,000 eggs. Pike in the small and medium-size ranges outnumber large pike, and the small and medium-sized pike contribute the majority of the total eggs spawned each year.

Northern pike spawn in April or May during ice break-up, generally moving into small tributaries and onto spawning areas before the main lake is free of ice. Spawning for pike occurs over mats of dead vegetation in shallow waters of marshes and marsh-like areas adjacent to lakes and streams. Males tend to enter spawning areas first and remain longer than females. Peak movements usually pass in 5 or 6 consecutive nights, if not suppressed by a sudden drop in temperature resulting from a spring snowstorm. Spawning activity occurs during the daytime over a period of two to three weeks when water temperature ranges from 6° C to 14° C. Regardless of temperature, the presence of vegetation is essential to stimulate pike to spawn. Studies have shown that females denied access to flooded vegetation due to low water levels failed to spawn and went through a process of resorbing their eggs.

Females do not select specific sites, nor do they build redds (egg nests). A male moves beside and presses against a female and both begin to vibrate causing the release of milt and eggs. The eggs whirl in the current caused by the spawning act and are fertilized. The fertilized eggs become sticky and adhere to vegetation, which keeps the eggs off the bottom. The female takes short periods of rest between the series of spawning acts.

The eggs hatch in 12 to 17 days in optimal water temperatures for incubation (9° C and 11° C). The newly hatched larvae have no mouth, no gills and only partially formed fins. These “premature babies” attach to vegetation and hang there motionless for five to ten days. This is possible because they have a sucker-like area of cells on each side of their head, called papillae, which secrete a sticky substance. While clinging to the plants, the larvae absorb nutrients from their yolk sac, and develop their fins, mouth and gills. At a size of about 10 to 15 mm, they shed their papillae and become free swimming fry. To avoid starvation, these fry must immediately begin to feed on microscopic organisms found on the vegetation and in the water.

The diet of pike fry changes quickly to a variety of aquatic insects. Northern pike convert to a predominately fish diet once they become fingerlings, but are still less than 50 mm in length. Initially, the fry of other species such as suckers and perch are important, but young pike grow rapidly, and soon are able to capture a variety of small fish. Submerged shoreline vegetation is extremely important for the successful rearing of young pike throughout their first summer.

Northern pike retain their fish diet as juveniles and adults, thereby assuming the role of one of the top predators in the food chain. Typically, pike lie-in-wait under the cover of weeds and ambush their prey. Pike feed on several species of minnows, perch, whitefish, cisco, trout-perch, sticklebacks, suckers, frogs, mice, young ducklings, and even other pike.

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[1] Total length of a fish is measured from the tip of the nose or jaw to the tip of the tail, with the tail pinched. [Fork Length to Total Length conversion factor —TL mm = 19.05 + 1.030 (FL mm)]

Individual pike populations tend to express a growth rate unique to the characteristics of the habitat of the specific water body, making it difficult to monitor and understand the status of pike populations. However, in general, pike in Alberta tend to grow quite rapidly because most Alberta lakes are shallow, warm and productive. Young northern pike can exceed lengths of 20 cm during their first summer. The Alberta angling record is 115.6 cm and 17.0 kg taken from Keho Lake in 1983. Northern pike in Alberta are capable of living to old ages, particularly in less exploited populations. This longevity can allow northern pike to exceed 20 years of age.

1.3 Distribution

Northern pike are distributed throughout Alberta, occurring in all of the large river systems, their tributaries and more than 400 lakes (Figure 1). Cold water temperatures and a low abundance of food fish are factors that discourage northern pike from moving into the upper headwaters of the mountains and adjacent foothills. Transfers of pike, both legal and illegal, have been extensive in southern and central Alberta, scattering this species into additional waters. Many transfers were successful, while others did not establish populations or the population has since been lost. Expansion of populations into some southern reservoirs has occurred through pike movements within irrigation systems. The historical distribution compared to the present distribution of northern pike in Alberta is difficult to discern because of poor historical records documenting transfers. Although the species still occupies the same general range as before, the presence or absence of pike at many smaller water bodies may or may not be the result of natural occurrences.

1.4 Status

Fisheries managers in Alberta Environment have examined data collect over the past 20 years from creel surveys of recreational fisheries, particularly in northeastern Alberta. Several indicators of declines and collapses of pike fisheries are evident. Between the 1980s and 1990s, the catch rate (fish/hour) has decreased by 47%, the success rate (% of anglers catching pike) has dropped by 45%, and the numbers and size of pike have declined. The status of the pike population at a specific water body is considered to be the same as the status of the recreational fishery described at the water; i. e., a stable fishery is considered to reflect a stable population; a collapsed fishery represents a collapsed population. Three management categories are used to classify a recreational pike fishery--stable, vulnerable and collapsed. These categories, in part, are based on the classification system used during the walleye management review (*Sullivan 1994*). The system describes the status of the recreational fishery by examining survey data for various biological parameters such as catch rate (fish kept/hour), success rates, age-class distribution, age-class stability, growth (length-at-age), age-at-maturity.

Northern pike fisheries can change in status and shift from one category to another depending primarily on the harvest pressure exerted on the population. Increased harvest pressure results in changes to the characteristics of a population, which, under continuing pressure, cause a decline in status. Population recovery requires a reduction in harvest to ensure that more northern pike reach their mature size. This will increase the number of spawning fish and subsequently increase the production of young fish. Based on the available habitat, the ability still exists for many water bodies to support more northern pike, although at a few lakes natural habitat limitations exist that reduce the lake's ability to produce pike.

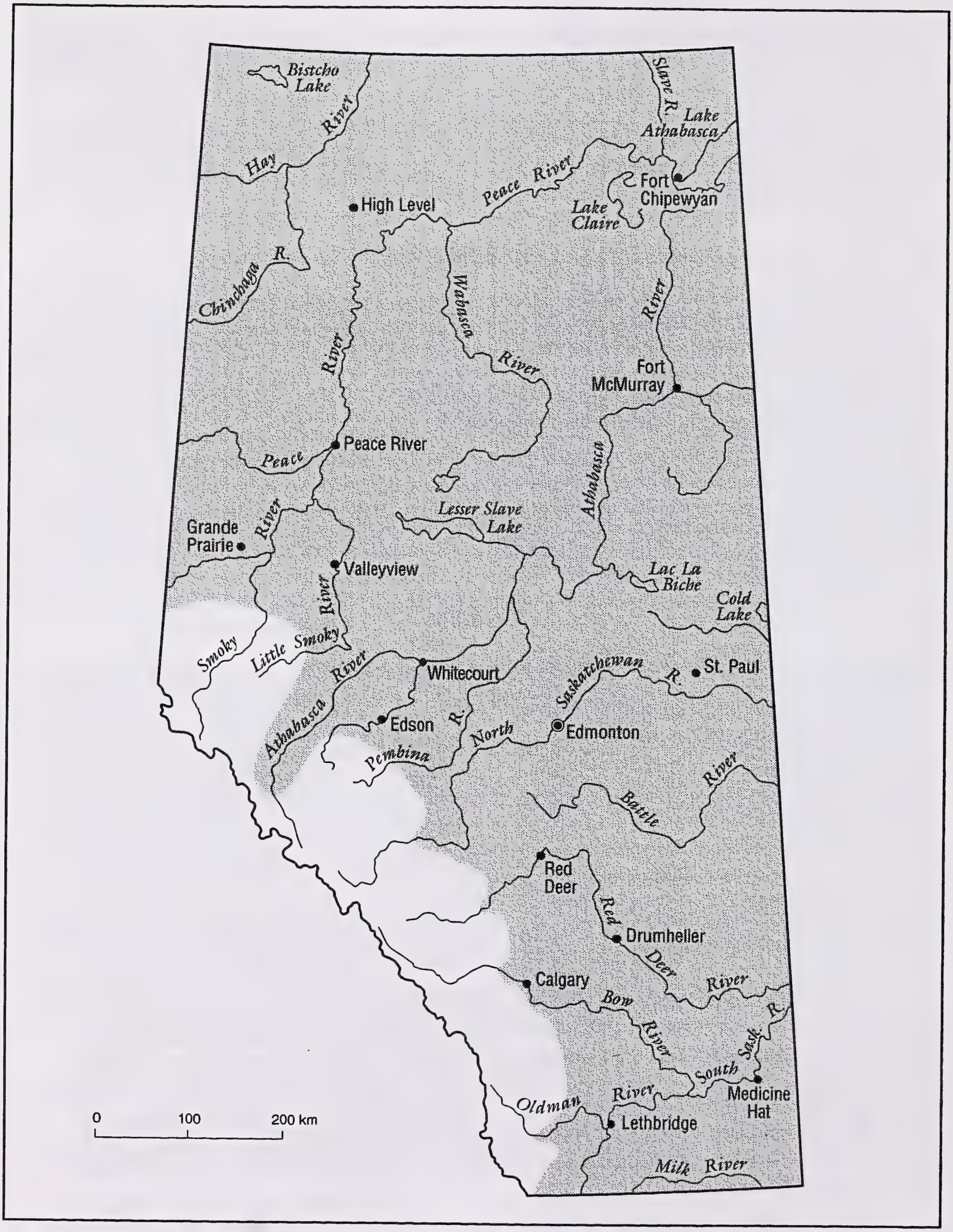

Figure 1: General Distribution for Northern Pike in Alberta (shaded area)

1.4.1 Stable Status

Stable pike populations support good catches, often at rates around 2 fish/hour. A range of fish sizes is present and occasionally large pike exceed the age of 15 (and 95 cm in total length). Fishing success is good throughout the lake and throughout the year. Stable pike populations occur in lakes that receive low to moderate fishing pressure, usually as a result of poor access and their distance from major towns and cities. These lakes provide good habitat because they have very little shoreline development. Fishing quality at stable populations is dependent on fishing pressure -- the heavier the harvest, the smaller the average size of the fish and the lower the catch rate.

1.4.2 Vulnerable Status

Northern pike populations in the vulnerable status have reasonable numbers of young pike, but low numbers of adults. Pike often measure up to 50 cm in length, but pike over 60 cm are rare. The age-class distribution is relative narrow and unstable. Pike in these populations grow reasonably fast and mature at a relatively young age. Catch rates are low to moderate (0.25 to 1fish/h). Typically, lakes with a vulnerable status have good access, some shoreline development (cottages or campgrounds) and moderate to high fishing pressure. Vulnerable populations can fluctuate between a state of recovery from periods of light fishing and a state of decline from periods of heavy fishing. In addition, the accessible river systems and their tributaries are considered to have northern pike populations in a vulnerable status. Most river populations of northern pike are susceptible to overharvest because in streams pike tend to be found in identifiable vegetative areas and at the mouths of tributaries.

1.4.3 Collapsed Status

Collapsed northern pike populations have very low densities of fish--few young fish and even fewer adults. These populations support insignificant fisheries with catch rates below 0.2 fish/h (about four hours of fishing for each fish caught). Even under moderate fishing pressure, few fish reach maturity, most being caught when still immature. As a result, the spawning segment of these populations is very small, even though growth can be fast and maturity can occur at a young age (age 4 for females and age 3 for males). Age-class distribution in a collapsed population is unstable, consisting of a narrow range of year-classes. Typically, lakes with collapsed populations are relatively close to large towns or cities, and have easy access, well-developed shorelines (cottages and campgrounds) and high fishing pressure.

1.4.3 Special Circumstances

At a few water bodies, the capability to create a stable pike population is limited by habitat conditions such as frequent winterkill, lack of sufficient spawning areas or inadequate food supply. Pike populations at these locations can remain in a state of vulnerability to sudden loss of fish production from natural climatic catastrophes. Fishing success depends on the extent to which the population has recovered since the last catastrophe. Sustaining pike populations at these water bodies may require habitat protection, rehabilitation and development strategies. Harvest control alone would not result in a shift to a stable population. In some small lakes, sustaining a stable pike population is not possible. In trout stocked ponds and trout streams, pike are undesirable and pike harvest is encouraged to promote trout production.

1.5 Major Limitations to Production

Several interrelated factors affect the rate at which northern pike are produced. The productive capacity of the species and the productive capacity of the habitat primarily control fish production. However, the level of fish harvest is a major factor that affects population stability. Major limitations to northern pike production in Alberta include the following:

1. Biological Constraints

The productive capacity of northern pike populations is influenced by biological constraints. Northern pike are broadcast spawners and provide no care for their eggs or young. Mortality during the first year has been estimated at as much as 99 percent of the eggs laid. Pike populations rely on spawning a large number of eggs each year in order that, despite high mortalities, enough of their offspring survive to adulthood. The presence of a sufficient number of spawners is essential to the maintenance of a stable population. The presences of shoreline vegetation and stable water levels are important to maintain healthy pike populations. Because pike are extremely dependent on the presence of vegetation, pike production is correlated to the lake's area of vegetative growth (littoral zone) more so than to the total area of the lake. Pike also sit on top of the aquatic food chain, which generally means their numbers are naturally low due to competition. Biological constraints of the species make pike populations susceptible to overharvest.

2. Productive Capacity of the Habitat

Alberta is not endowed with an abundance of surface water, having only 2.5 percent (16 500 km^2) of its area as freshwater. Surveys indicate that Alberta has only about 800 lakes with game fish populations and an additional 200 to 250 lakes stocked annually with trout. In comparison, Saskatchewan has an estimated 94 000, Manitoba has 110 000 and Ontario has 250 000 fish-bearing lakes. Although limited in number, lakes in Alberta tend to be productive and are capable of supporting good pike populations. At a few lakes, however, conditions such as frequent winterkill, lack of sufficient spawning area or inadequate food supply limit the lake's capability to support a stable pike population.

Alberta is prone to shifts in climatic conditions that influence spawning, hatching and rearing success. Cold weather just before or during spawning can delay, interrupt or even prevent spawning. Periods of low precipitation can result in low water levels that reduce access to spawning areas, result in egg loss from the drying up of spawning areas, or a reduction in the amount of rearing area. The loss of shoreline vegetation seriously impacts pike production.

3. Habitat Alteration

Habitat alteration, particularly the removal of shoreline weed beds, has contributed to the decline of northern pike populations in some lakes. Because of the pike's sedentary pattern of life and dependence on weedy areas, stable habitat conditions are very important for the maintenance of stable pike populations. Population density can be impacted even by localized alterations of shoreline vegetation and by changes in water levels. Land clearing along streams and in upland areas around lakes reduces water flows and lake-water levels, which in turn can result in the loss of available spawning and rearing areas. The loss of this important habitat also alters the community of small fishes, which supports the food chain; and reduces the areas of shelter, which increases losses of young pike to cannibalism by adults. Sediments and nutrients entering water systems affect water quality and reduce the suitability of smaller lakes for northern pike. In some cases, beaver activities and roadway culverts in streams have reduced northern pike movements to spawning areas.

4. Overharvest

The northern pike is a quality food fish that has been harvested in commercial and recreational fisheries since before the turn of the century. High harvest levels reduce population density, particularly by removing the larger/older pike, which subsequently reduces a population's spawning capability.

In the past, commercial harvest has been excessive at some lakes. The current practice is to keep pike harvests at commercially fished lakes within low tolerance limits. The time of year that fishing is allowed and closed zones, where netting is not permitted, are established to minimize the harvest of pike. Strict controls on commercial fishing are important because gill netting can select for the mature, and mainly female, segment of the population. However, northern pike populations have also declined at lakes where commercial fishing has not occurred. Domestic fishing results in a relatively small harvest of northern pike because of the low numbers of individuals involved in this form of fishing.

Northern pike can be very predictable in their habits. Using personal knowledge of where-when-and-how to fish, experienced anglers seldom find it a problem to catch northern pike even at lakes with low population densities. Anglers are very mobile and frequently shift their effort to water bodies supporting better catches, until catch rates decline.

Alberta has a limited number of lakes with fish (about 800), but very high angling pressure (nearly 400 anglers per lake). In comparison, Ontario, Manitoba and Saskatchewan average about 2 anglers per lake because of the thousands of lakes in those provinces. Regulations must be specifically designed to meet the fishing pressures and pike population at Alberta lakes. At present, the sport fishery takes the majority of the annual pike harvest in Alberta. In 1995, about 350 000 anglers spent over 3.7 million days fishing in Alberta, which was nearly double the fishing pressure of 20 years ago. The harvest of pike (fish kept) peaked in the 1980 recreational survey at 2.8 million and declined to 0.9 million by the 1995 survey. Although anglers reported catching 3.3 million pike in 1995, 70% were released by anglers practicing voluntary catch-and-release, or possibly because anglers were dissatisfied with the size of those pike. Recent surveys indicate the heavy harvest of pike since the 1970s has significantly reduced the adult segment to the extent that pike larger than 100 cm are rare in many populations.

Poor compliance with sportfishing regulations represents an illegal harvest of northern pike. Frequently, anglers fail to respect regulations, possibly believing that the keeping one fish over the limit can cause little harm. However, the collective effect of anglers independently ignoring regulations results in the illegal harvest of many fish.

Illegal netting of fish (poaching) can impact northern pike populations, which is why undercover enforcement operations are used to crack down on the illegal catching, selling and buying of northern pike. Unfortunately, a large market place is available for the sale of illegal fish, which requires a continued effort to overcome.

2.0 MANAGEMENT PLAN

2.1 Management Policy

Alberta's Northern Pike Management and Recovery Plan is based the goals and guiding principles presented in the document *A Fish Conservation Strategy for Alberta* (Fisheries Management Division 1997). The mission statement for fisheries management from that document is:

> **"To sustain the abundance, distribution and diversity of fish populations at the carrying capacity of their habitats."**

Conservation includes two components: 1) protection which ensures the perpetuation of abundant fish populations, and 2) the appropriate use of only the surplus that is not required for population maintenance. Conservation of fish resources can not be achieved through control of fish harvest alone--habitat maintenance is essential. In order for Albertans to enjoy the benefits that fish and fishing provide, there must be a sufficient fish resource available, which means there must be sufficient habitat.

The following are three components of the mission statement:

- **Habitat Maintenance** -- sustain, or achieve a net gain in, the quality and quantity of fish habitat.

- **Fish Conservation** -- regulate fish harvest in line with, and not exceeding, the productive capacity of fish populations.

- **Fish-Use Allocation** -- manage fish populations in a manner that meets the present needs of Albertans without compromising the ability of future generations to meet their needs.

The guiding principles that help achieve the mission statement and goals are outlined in *A Fish Conservation Strategy for Alberta.* They are:

1. **No net loss of the productive capacity of habitats.**
   Every effort must be made to avoid habitat losses. If habitat losses are unavoidable, they should be balanced with habitat replacement.
2. **Fish populations are to be maintained by natural reproduction wherever possible.**
   Natural reproduction is the most biologically sound and cost-effective way of maintaining fish populations and fish production.
3. **The biological diversity of the fish fauna is to be maintained, and the depletion or extirpation of native fish species, populations, sub-populations or unique strains will not be permitted.**
   Any maintenance and protection strategy must include all fish species in order to maintain the biological diversity of the fish fauna.
4. **The management of fisheries will be based on fundamental ecological principles and factual information.**
   Good and timely information on fish (including their number, growth, production rate, harvest rate, habitat needs and habitat conditions) is fundamental to achieving habitat maintenance, fish conservation and fish-use allocation goals.
5. **There should be public involvement and education in the fisheries management process.**
   Greater public awareness and the involvement of a knowledgeable public are essential to increase public support for fisheries management.

6. **The "user-pays philosophy" should apply to the financing of the stewardship and management of fish resources.**
   The responsibility for financing the stewardship of fish resources must be shared by all, and supported directly by resource users such as anglers, resource developers and industries.
7. **Public access should be provided and maintained to waters producing publicly owned fish.**
   Unencumbered access to waters producing publicly owned fish is a prerequisite to using fish resources for public benefits.

2.2 Goals and Objectives

The overall goal of Alberta's Northern Pike Management and Recovery Plan is:

> **"To sustain the abundance, distribution and diversity of natural reproducing northern pike populations and provide domestic, recreational, commercial and economic benefits to Albertans."**

2.2.1 Habitat Maintenance Goal

Restore and maintain the natural productive capacity of northern pike habitat, and where possible and appropriate, increase the amount of productive northern pike habitat.

Many aspects of habitat maintenance are not within the direct control of the Fisheries and Wildlife Management Division; therefore, the Fisheries and Wildlife Management Division must act as an advocate to have habitat maintenance integrated into the goals of natural resource users. Habitat protection, habitat mitigation and water quality need to be treated by all resource users as essential components of resource management planning. To achieve the habitat maintenance goal, water-use legislation and policy have to recognize fish as a user of water and incorporate the needs of fish into water resource management. Resource stewardship, although a mandate of government, is the responsibility of everyone--the general public and proponents of resource use.

In Alberta, the habitat program of the Fisheries and Wildlife Management Division uses the policy of no-net-loss of productive fish habitat as a working guideline for decision making *(Policy for the Management of Fish Habitat,* Fisheries and Oceans Canada 1986). Legislative authority for the fish habitat provisions continues to reside with the Minister of Fisheries and Oceans. The objective of the federal policy is to achieve a net gain of habitat for fish resources. However, there are strict limitations on the potential to increase the productive capacity of habitats. Fish resources and fish habitats are finite and every effort to avoid habitat loss or damage must be made.

2.2.1.1 Habitat Maintenance Objectives

Habitat Protection -- maintain the productive capacity of aquatic habitats to support healthy and diverse northern pike populations.
Habitat Rehabilitation -- alleviate or reverse adverse impacts on the productive capacity of habitats and repair damaged habitats.
Habitat Development -- enhance habitats in areas where the production of northern pike populations can be increased, but maintain the aesthetic qualities of these sites.

2.2.2 Fish Conservation Goal

Restore and maintain the abundance, distribution and diversity of northern pike populations through natural reproduction.

Northern pike populations in Alberta are declining to the extent that it is becoming difficult to satisfy current demands and meet future needs. As a consequence, managing for conservation first is necessary. In this context, conservation focuses on sufficient protection to ensure abundant pike populations and the appropriate use of only the surplus that is not required for population maintenance.

2.2.2.1 Fish Conservation Objectives

Fish Production Maintenance -- maintain the abundance and diversity of pike populations at the carrying capacity of their habitat.

Fish Production Restoration -- restore diminished pike populations to full production wherever possible.

Fish Production Enhancement and Development -- enhance or develop pike production where appropriate and possible.

Beyond habitat conservation, the fish conservation objectives involve managing fish harvest by:

1) managing human activities through fish-use allocation,
2) changing public attitudes through information and education, and
3) encouraging compliance through enforcement.

2.2.3 Fish-Use Allocation Goal

Allocate the appropriate uses of northern pike resources to achieve a range of optimal public benefits that support the fish conservation goal.

Sustaining viable fisheries, and optimal benefits from their use, requires the recovery and maintenance of northern pike populations throughout Alberta. Opportunities to harvest some pike should be permitted so long as the primary emphasis upon conservation is not compromised. The importance of the use of other species occupying water bodies with northern pike should not be overlooked and should be maintained as much as possible.

2.2.3.1 Fish-Use Allocation Objectives

Fish-use allocation must emphasize conservation, but also provide for domestic, recreational and commercial benefits, now and in the future.

1. Domestic Use

Arrangements for subsistence fishing by Indian people were included in treaties and affirmed in the *Constitution Act* (1982). More recently, the *Sparrow Decision* (1990, Supreme Court of Canada) has affirmed the limits that can be applied to subsistence fishing rights. The *Fish and Wildlife Policy for Alberta* (Fish and Wildlife Division 1982) supports and endorses subsistence fishing by Alberta's Indian people.

Northern pike do not constitute a significant portion of harvest in the domestic fishery because of the low numbers of individuals involved in this form of fishing. Lake whitefish is the typical target species and access to enable sufficient harvest levels to fulfil traditional needs must be maintained.

The following objectives must be met:

a) Develop management options for specific lakes that will conserve northern pike populations, sustain subsistence fishing and maintain recreational and commercial fishing benefits.
b) Minimize the harvest of northern pike, yet enable sufficient harvest levels of lake whitefish to fulfil traditional subsistence needs.
c) Minimize the use of lakes having significant northern pike conservation concerns, whenever possible and appropriate.

2. Recreational Use

The *Fish and Wildlife Policy for Alberta* (Fish and Wildlife Division 1982) promotes recreational fishing as a legitimate activity, in addition to promoting rules to regulate activities and encouraging the ethical conduct of anglers. Sportfishing for northern pike will be managed in consultation with sportfishing organizations and the general public.

The following objectives are directed to the control of the sport fishery to address the significance of this fishery as the major resource user:

a) Sustain a broad range of recreational opportunities related to fishing for northern pike.
b) Achieve low mortality on released northern pike.
c) Achieve, within the angling community, a philosophy of conservation emphasizing non-consumptive use.
d) Maintain fishing opportunities for other important fish species, wherever possible.

3. Commercial Use

In accordance with the *Fish and Wildlife Policy for Alberta*, a viable commercial fishing industry will be encouraged. Lake whitefish and tullibee (cisco) are the target species and reasonable access to these species will be maintained. Water body management plans, as outlined in the *Water Body Management Strategy System* (Berry 1994), need to be developed for commercially fished lakes to address allocation issues. At commercially fished lakes, setting minimal tolerance limits for northern pike will be the practice, and achieving compliance with these limits will be the objective (*Fisheries Management Division Operating Guidelines Respecting Commercial Fishing*, Natural Resources Service, 1996).

Commercial use of the fish resources will be managed in consultation with commercial fishermen and recreational users to meet the following:

a) Recognize commercial fishing as a viable industry and a valid user of the fish resource to meet the food-fish needs of the public.
b) Minimize the harvest of northern pike, yet achieve allocated harvest levels for lake whitefish and tullibee.
c) Minimize the commercial use of lakes having significant northern pike conservation concerns, high angling pressure, and low commercial catches of lake whitefish with marginal economic returns.

4. Tournaments and Derbies

Tournaments and derbies are activities that combine sportfishing with commercial ventures and use the fish resource for both recreation and economic gain--for the sponsors, promoters and community and, in some form, for the participants. Tournaments and derbies tend to attract more anglers, than might otherwise visit, to the water bodies where they are held. The participants keep most of the pike they catch and can take a large portion of the annual production in just a few days.

Although tournaments just for pike are uncommon, the northern pike is an important prize fish in mixed-species tournaments and derbies held throughout Alberta. Catch-and-release fishing for pike at tournaments is also uncommon; however, if it were, high hooking mortalities could be a problem. Northern pike receive considerable damage and stress from confinement in containers such as live-wells, tanks and cages. Mortality increases when water temperatures are high or lakes are rough from windy conditions. Also, freezing conditions during winter can result in damage particularly to the eyes, gills and fins.

At present, no controls are in place to restrict tournaments any more than sportfishing regulations do. Some tournament organizers have developed self-regulation rules as registration requirements. Ninety per cent of Alberta anglers responding to a survey (National Survey on Recreational Fishing 1995) supported the establishment of a mandatory licensing system for tournaments and derbies in Alberta. Support for a licensing system was also received during the walleye management review and from over 80% of the participants in the pike management review. A Competitive Fishing Events Review Committee, comprised of representatives from several stakeholder organizations, has been established to examine tournaments and derbies. The first task of the committee is to compile guidelines for the proper operation of tournaments and derbies that will form the basis of future controls on the activity.

The management of tournaments and derbies requires the following:
a) Achieve changes to the Fisheries (Alberta) Act and regulations to establish a mandatory licensing system for tournaments and derbies.
b) Minimize the effect of tournaments and derbies on traditional recreational use.
c) Minimize the effect of tournaments and derbies on fish conservation and the recovery of northern pike populations.

2.3 Management Strategies and Actions

The exact number of distinct northern pike populations in Alberta is unknown and in many lakes the current status of the pike fishery is not well documented. However, northern pike occupying different watersheds represent different populations. In most cases, northern pike occupying different lakes in the same watershed are isolated and constitute separate populations. Each population, within its production limitations, must be protected from decline and managed for recovery and sustained (lake-by-lake management).

2.3.1 Habitat Protection, Rehabilitation and Development Strategy

Habitat as used in the context of this strategy also includes instream flow needs, lake levels, water quality, fish health and ecosystem integrity. Habitat disturbances result from oil, gas and mineral exploration and extraction, timber harvest, road and pipeline construction, road surfaces, ditches, side slopes, agriculture and cattle grazing, and industrial and recreational developments. A policy of no-net-loss of productive fish habitat will be used as a working guideline. Where mitigative procedures can not eliminate habitat losses, then fish habitat compensation is necessary.

The habitat protection, rehabilitation and development strategy involves:
- Implementing an education, protection and reclamation program about lakeshore and spawning habitat.
- Enforcing regulations that apply to shoreline development and habitat protection.
- Identifying and protecting habitats for all life stages of pike, particularly spawning and rearing.

- Identifying important pike migration routes and maintaining these routes free of blockages, such as beaver dams and poorly installed culverts.
- Implementing habitat enhancement projects to improve spawning and rearing areas, and fish access to them, and to improve lakeshore vegetation cover and stability.
- Identifying and maintaining adequate habitat protection guidelines to minimize, ideally to zero, any impacts from physical disturbances of shoreline vegetation or within watersheds that affect water flow, water temperature, stream sedimentation, nutrient loading and contaminant levels in fish.
- Restricting or limiting instream and shoreline work to appropriate time periods and activities that can be fully mitigated.
- Requiring proponents of development (natural resource, industrial and recreational) to rehabilitate the habitat they alter to maintain productive capacity.
- Requiring the proponents of instream work and shoreline development to determine the extent and type of fish use and habitat base of affected area prior to disturbance, incorporate appropriate habitat protection and compensation measures into development plans, monitor results of compensation actions and maintain habitat compensation features.
- Advocating habitat maintenance and fish conservation, and working with proponents of resource development to integrate fish habitat needs into their resource management planning.
- Advocating water-use legislation and policies that recognize fish as a user of water and the incorporation of the needs of fish into water resource management.

2.3.2 Fish Production, Restoration and Enhancement Strategy

The fish production, restoration and enhancement strategy involves addressing limitations to fish production at each water body and taking action to recover and maintain pike populations. In addition to habitat maintenance, the management and recovery of northern pike populations requires the following:

- Developing operational plans for each Fisheries Management Area as well as lake-specific management plans to address allocation concerns and the status of northern pike populations.
- Regulating pike harvest to match and not exceed the productive capacity of the habitat.
- Reducing the loss of immature northern pike, permitting northern pike to live longer and grow to a mature, spawning size.
- Reducing the loss of mature northern pike to maximize, and increase, the available number of spawners and hence to ensure an increased production of young fish.
- Reducing disturbance and harvest of spawning northern pike to ensure adequate recruitment.
- Maintaining abundant numbers of prey species to ensure good northern pike growth and survival.
- Allowing the harvest of other species, whenever possible.
- Encouraging the maintenance of wilderness and heritage values where appropriate.
- Establishing or re-establishing northern pike populations where appropriate.

2.3.2.1 Northern Pike Transfers

The complex life-history characteristics of young pike make it difficult and costly to culture northern pike in hatcheries. The establishment of programs to raise pike in hatcheries is not currently planned and is not recommended. Restoring fish production must rely on habitat maintenance, habitat enhancement and harvest regulation, rather than fish stocking. Transfers of northern pike will be guided by the document *A Decision-Making Process for the Evaluation of Fish Introductions in Alberta* (Berry and Stenton 1993). Fish production based on natural reproduction has priority over transfers, but where approved, transfers of northern pike must meet policies pertaining to the protection of sensitive species and ecosystems, and the maintenance of genetic integrity.

Transfers of northern pike will be limited and will be guided by the following:

- Using pike transfers to develop new populations where appropriate, preferably in small land-locked lakes that are devoid of wild game fish populations. Catch-and-release fisheries (0 limits) would occur at such sites to help establish self-sustaining populations.
- Ensuring the use of genetically compatible stains to re-establish lost or collapsed populations.

2.3.3 Fish-Use Allocation Strategy

The fish-use allocation strategy involves water body management planning, through a process of consultation with user groups. Only the harvestable pike production (surplus to conservation needs) will be allocated to various uses. The *Fish and Wildlife Policy for Alberta* stipulates that until lake-specific allocation plans are developed, interim allocation priorities will be in the following descending order:

- Conservation of fish stocks,
- Subsistence fishing for Indian people,
- Resident recreational use, and
- Commercial fishing, and tourist angling.

2.3.3.1 Domestic Allocation

The traditional subsistence fishing needs of Alberta's Indian people must be met. Beyond conservation needs, priority for use of the fish resource goes to subsistence fishing for Indian people. Subsistence fishing will be managed in consultation with native communities to minimize impacts to northern pike populations, which requires the following:

- Using zone closures at lakes where necessary to reduce pike harvest, but allow access to lake whitefish harvest.
- Establishing spring closure of critical spawning areas.
- Maintaining controls on gill net mesh size.
- Licensing the use of alternative gear and methods that have less impact on pike populations.

2.3.3.2 Recreational Allocation

The harvestable supplies of northern pike at lakes and streams are limited. Recreational benefits at some lakes and streams must be based on selective harvest and the release of most pike to promote population recovery. Life-history patterns, such as growth, age-class distribution, age and size at maturity, catch rates and density, for individual pike populations tend to be an expression of the characteristics of the habitat unique to the specific water body. Although, a consistent management approach based on population status categories can be used across the province, site-specific regulations must meet the unique needs of the pike populations at each water body. Sustaining a variety of recreational opportunities to meet the expectations of Alberta anglers within the constraints of fish conservation requires the following:

➢Developing a biologically sound and socially acceptable framework of objectives, strategies and actions concerning the management of northern pike populations in Alberta. This action was completed by the Northern Pike Management Advisory Committee (*Northern Pike in Alberta-Public Review of Future_Fishery Management* 1998), by holding interest group workshops throughout the province concurrent with the preparation of this management and recovery plan.

The Northern Pike Management Advisory Committee adopted the following framework:

- Lake-by-lake management of pike populations will be emphasized, but where information is limited, a general set of regulations will be used as an interim measure. The following four management categories were defined.

  1. **Stable** – a healthy pike population that allows for opportunities to catch pike in a range of sizes. Fishing is generally good throughout the water body. Stable populations are managed to sustain healthy populations, using regulatory actions for "moderate harvest," provided a harvest does not result in population decline. The stable category is further classified into three sub-categories providing for a variety of angling experiences:
     - Stable-Recreational – managed to provide good catch rates of pike, but not necessarily large fish.
     - Stable-Quality – managed to provide pike of a medium size, over 70 cm total length (2 to 4 kg), although fewer pike can be kept.
     - Stable-Trophy – managed to provide pike of a large size, over 100 cm total length (> 9 kg), although fewer fish can be produced.
       NOTE: Seibert Lake Trophy Pike Licence -- A pilot study to manage Seibert Lake under a special licence scheme that would have a fixed number of licenses issued each year was recommended. Seibert Lake has been a trophy status pike fishery for over 25 years. Special regulations to control harvest have been in place; however, the lake has received excessive fishing pressure and the trophy qualities are not currently being sustained.

  2. **Vulnerable** – a pike population with low numbers of adult pike and reasonably abundant small pike, but low to moderate catch rates (fish/hour). Vulnerable populations are managed to promote population recovery to stable recreational fisheries, using regulatory actions for "minor harvest," provided the primary emphasis upon conservation is not compromised.

  3. **Collapsed** – a pike population with undesirable low numbers of adult and younger fish. Collapsed populations are managed to promote population recovery to stable recreational fisheries, using regulatory actions for "no harvest."

  4. **Special Circumstances** – a pike population in a body of water where there is limited capability to sustain a stable population because of habitat limitations (e.g., frequent winterkill, stunted growth, or marginal spawning area). This category also includes locations where pike are not a desirable species (e.g., trout streams or trout stocked ponds). Pike populations with special or unique circumstances are managed to provide average pike fisheries within the limitations of the water body or to promote pike harvest. At some remote locations, fishing pressure may be light enough to not require size limit restrictions.

- Assessing the status and classifying the pike fishery at each lake or stream.
  Fisheries managers throughout the province will accomplish this action with local stakeholder consultation. Pike populations will be assessed and classified. Populations with similar status will be grouped into categories and appropriate management tools for each group will be applied to those individual populations through lake specific regulations (see Section 2.5).

- Adjusting water bodies to a different set of sportfishing regulations in response to:
  a) Changes in population status (more restrictive regulation if a population declines, and less

restrictive regulation when a population shows sufficient recovery).

b) Significant increase in fishing pressure (more restrictive regulation).
c) Significant decrease in compliance (more restrictive regulation).
d) Changes in management strategy for provision of quality or trophy fisheries at some water bodies, using special regulations.

Fisheries managers throughout the province will accomplish the above action with local stakeholder consultation on an ongoing basis (regulations are published annually in the Alberta Guide to Sportfishing Regulations).

2.3.3.3 Commercial Allocation

Maintaining a viable commercial fishing industry within the constrains of fish conservation, subsistence fishing and recreational fishing requires the following:

- Developing allocation plans as part of the water body management planning process to minimize fish-use conflicts and ensure impacts on pike populations from commercial fishing are negligible.
- Continuing to set tolerance limits for northern pike in the commercial harvest.
- Achieving compliance with tolerance limits.
- Refining depth or area closures, timing of seasons, and restrictions on the number, kind and size of gear.
- Examining the use of selective gear types such as trap nets.

2.3.3.4 Tournaments and Derbies

The development of a regulatory system to govern tournaments and derbies is scheduled for implementation in the year 2001. The first steps include compiling guidelines for the operation of tournaments and derbies (*Competitive Fishing Events Review Committee*) and establishing a mandatory licensing system for tournaments and derbies (*Fisheries (Alberta) Act and Regulations*). The Tournament and Derby Licence System is required for the following:

- Controlling the numbers and sizes of tournaments and derbies at specific waters during specific time periods.
- Restricting tournament and derby activities at collapsed and vulnerable status lakes, and at lakes where the intent is to promote trophy status fishing.
- Restricting tournament and derby activities at lakes where loss of northern pike from such activity is excessive.

2.3.4 Public Involvement, and Information and Education Strategy

Public involvement in fisheries management is growing quickly. Volunteers have assisted with many habitat development and restoration projects, and with fish population sampling studies. Volunteer programs often provide excellent opportunities for educating the public. Project funding from the Alberta Conservation Association's Fisheries Habitat Development and Fisheries Management Enhancement programs has provided many volunteer opportunities other than those provided by government programs. There is considerable enthusiasm among anglers, particularly members of sportfishing organizations, for participating in this type of activity and it is becoming a part of their overall recreational experience.

Greater public awareness is essential to increase support for the management and recovery of northern pike. Any attempt to regulate the harvest of pike will be ineffective without the successful education of the public and the general acceptance of regulations. The public involvement, and information and education strategy involves:

- Working with industry, other stakeholders and various levels of government to develop a greater appreciation for the importance of habitat protection.

- Establishing a significant public information and education program about pike that includes the role of habitat management and the impacts and roles of different user groups.
- Explaining domestic and commercial fisheries to the public at large, with sport fishermen as the primary audience.
- Communicating to the public, industry and various levels of governments the habitat needs and biological requirements for pike conservation.
- Including non-government organizations in public information and education programs.
- Encouraging public involvement in:
  - Advocating the priority of fish conservation needs over other uses.
  - Participating in angler surveys and fish population monitoring studies.
  - Conducting habitat enhancement projects to improve spawning and rearing areas, to remove or reduce the impacts of stream blockages, to improve lakeshore vegetation cover and stability, and to stabilize water levels.
  - Identifying pike fisheries that have special values and characteristics that should be retained to ensure the quality of the fishery, including wilderness experience and "heritage" values.
  - Acting as an advocate of habitat maintenance and encouraging the incorporation of fish habitat needs into resource development planning and water management.
  - Participating in the Alberta Conservation Association's REPORT-A-POACHER program to report suspected resource violations.
- Encouraging industrial developers and other natural resource users to provide funding for research and impact-assessments.

2.3.5 Enforcement Strategy

It is difficult to achieve angler compliance with fishing regulations through enforcement, without first achieving public acceptance of the management plan through public education. A well-informed public will increase angler compliance and assist enforcement efforts. The enforcement strategy involves:

- Setting priorities on district enforcement needs for public information and education, protection of critical pike habitat and regulation enforcement.
- Developing district programs that improve compliance with pike regulations through education, prevention and enforcement.
- Enforcing regulations that protect critical habitat.
- Continuing covert operations to discourage and apprehend individuals and businesses involved in the illegal catching, selling and buying of northern pike.
- Encouraging courts to levy higher fines for serious offenses.
- Enforcing tolerance limits for northern pike in the commercial harvest.

2.4 Inventory, Monitoring and Research Needs

The long-term success of Alberta's Northern Pike Management and Recovery Plan depends on the availability of good and timely information which is fundamental to achieving the habitat maintenance, fish conservation and fish-use allocation goals. The government is responsible for conserving fish resources for all Albertans and for future generations. However, fees and levies on direct resource users such as anglers, and on indirect resource users such as industries that alter habitat, should augment government financing. The Alberta Conservation Association can play an important role by assisting with the financing of pike studies. Additional opportunities should be investigated, such as funding from industries that impact fish resources, to study problems and to research methods that reduce impacts.

Inventory, monitoring and research is required to:

- Gather relevant information on fish stocks including their number, growth, production rate, harvest rate, and to determine the status of populations and the numbers that constitute a harvestable surplus.
- Gather relevant information to assess the effectiveness of regulations, and habitat protection, rehabilitation and enhancement.
- Gather relevant information on fish habitat conditions and identifying and recording the location of critical pike habitat and migration routes requiring protection, rehabilitation or enhancement.
- Conduct specific studies of life history, including movements and critical habitat requirements.
- Conduct studies to understand the interaction between land-use impacts and natural events that limit or enhance pike populations.
- Investigate ways to reduce hooking mortality (such as gear restrictions, bait bans).

2.5 Sportfishing Regulations Development

Public responses received during workshops and from survey questionnaires were reviewed by the Northern Pike Management Advisory Committee and compiled into a biologically sound and socially acceptable framework for the assignment of regulations. Emphasizes was placed on lake-by-lake management. Changes to sportfishing regulation for northern pike commenced on April 1, 1999, and on an ongoing basis, further adjustments to regulations at site-specific locations will be implemented where information indicates that changes are appropriate (detailed regulations are published annually in the Alberta Guide to Sportfishing Regulations). New sportfishing regulations recommended by the committee are outlined below:

2.5.1 Catch Limits and Size Limits

Catch limits alone are ineffective at controlling the total annual harvest. A large number of anglers at a lake can take a large number of pike, even when the catch limit is only one or two. However, low limits help reduce harvest during peak fishing periods, redistribute the available harvest among more anglers and spread the harvest over a longer time period. Coupled with appropriate size limits, a reduced daily limit will result in the availability of more spawners and will subsequently result in an increase in the production of young fish. Minimum-size limits are designed to protect young pike until they have spawn two or three times before becoming large enough to be kept by anglers. At some lakes, larger minimum-size limits may be set to provide quality fishing for larger pike.

In 1999, a province-wide limit of 3 pike over 63 cm total length has been implemented. Water body specific exceptions occur at most trout streams, at trout stocked ponds and at a few lakes managed under special circumstances. Starting in the year 2000, and thereafter, lake-by-lake regulations for pike will be implemented. As required, exceptions to the province-wide limit will be set at 2, 1, or 0, along with special size limits, to meet specific management needs, using the following guidelines:

Stable-Recreational: The majority of pike populations will be managed as stable-recreational fisheries to provide good catches of pike, but not necessarily large fish. These locations will have a limit of 1 to 3 pike over 63 cm depending on angling pressure.

Stable-Quality: Some pike populations may be selected as quality fisheries managed to provide pike of medium size, over 70 cm (2 to 4 kg), but not necessarily in large numbers. At these locations the limit will be 1 to 3 pike over 70 cm, depending on angling pressure.

Stable-Trophy: Some pike populations may be selected as trophy pike fisheries managed to provide pike of large size, over 100 cm (9 kg), but not necessarily in large numbers. One option is 1 pike over 100 cm and possibly 1 to 2 under 63 cm, depending on angling pressure.

Vulnerable: These pike populations will be managed to promote population recovery to stable recreational fisheries. At these locations the limit will be 1 pike over 63 cm.

Collapsed: These pike populations will be managed to promote population recovery to stable recreational fisheries. At these locations the limit will be 0-limit (catch-and-release only).

Special Circumstances: In some locations no size limit will apply to the pike limit. For examples, at trout stocked ponds and trout streams containing pike, and at a few lakes where there is limited capability to sustain a stable pike population because of natural habitat limitations. At some remote locations, fishing pressure may still be light enough to not require size limit restrictions. At these locations the regulation will be 1 to 3 pike (no size limit).

2.5.2 Bait Restrictions

The need for total bait bans was examined and considered unwarranted at this time, although a bait restriction was recommended at lakes with collapsed pike populations. Starting in 2000, only the use of maggots and meal worms would be allowed at lakes where catch-and-release regulations for northern pike (0-limit) are implemented. This restriction is intended to reduce hooking mortality of pike at zero limit lakes by reducing deeply hooked pike caught on bait, but still allow traditional fishing for lake whitefish and perch.

High hooking mortalities in trout resulting from the use of bait are well documented. Bait, natural and scented, generally result in 25–30% hooking mortality, whereas the use of flies and lures results in less than 5% loss. Hooking mortality studies for pike are limited and inconclusive. Differences in mortality rates of released pike caught on unbaited lures and baited hooks in most studies are quite similar, in the range of 3 to 10%. Current information does not support a mandatory restriction on the use of bait at all waters containing pike, walleye or perch. The primary cause of hooking mortality is injury to the fish caused by deep hooking in the gill area, tongue, roof of the mouth, esophagus and stomach region. Restricting the use of baits other than maggots and meal worms may reduce the number of pike caught on set lines and reduce the occurrence of deep hooking. Assessing the need for regulation changes is an ongoing process and the issue regarding the use of bait will be re-examined should results from new studies shed light on the issue

2.5.3 Number of Lines Allowed When Angling Through Ice

Starting in 1999, each angler may use only two lines when ice fishing (angling through ice). Lines that are not continuously attended (actively fished), generally used with baited hooks (still-fished baits), increase the occurrence of deeply hooked fish. Severe bleeding from hook damage to the gills or gullet (deeply hooked) is a major cause of mortality of released pike. Reducing the number of lines in use at one time by anglers ice-fishing may reduce the occurrence of deeply hooked fish.

2.5.4 Bowfishing and Spearfishing

The use of bow and arrows, and spears for the purpose of taking pike can not be permitted because of the size limits that apply to pike populations throughout the province. There is a considerable difficulty in accurately estimating the length of a fish in the water, and pike of an illegal size are not likely to survive release after being taken by arrow or spear.

2.5.5 Sportfishing Seasons

Spring sportfishing closures of waters in the Parkland-Prairie and Northern Boreal Zones are proposed for the year 2000. Pike require protection from harvest and harassment during their spawning period when they are most vulnerable. In many populations, mature pike are in low numbers and must be protected to maximize their spawning potential. Pike spawn during the daytime and are active during the time most anglers like to fish. Mature, ripe females caught and handled by anglers can lose a portion of their eggs, or be stressed and delay spawning. Therefore, closure of lakes and their critical spawning areas is preferred over catch-and-release fishing (0-limit) during the pike spawning period in the spring.

Starting and ending dates for spring closures may vary slightly throughout the province matching closures to regional differences in the timing of pike spawning. In general, spring closures may involve the following approximate time periods:

- Southern Alberta—March 16 to about May 7.
- Central Alberta—April 1 to the May long weekend.
- Northern Alberta—April 1 to the May long weekend.
- In the Northern Boreal Zone, the existing closure for streams from April 1 to May 31 will remain in place.
- In the Eastern Slopes Zone, the existing closures will remain in place; however, additional closures may be required at lakes in the northern portion.

Sportfishing opportunities during the spring may be accommodated at stocked ponds that over-winter trout, in some of the larger streams and at a few lakes (e.g., during carefully managed, spring commercial fishing seasons that target lake whitefish without significant impacts to pike or walleye). However, lakes that remain open in the spring should have stable fish populations and may require special zoning to closure critical areas. The broad nature of spring sportfishing closures is not intended to impact domestic fishing for lake whitefish; however, some lakes will be closed to all fishing or have areas closed to all fishing as a conservation measure to protect pike spawning.

2.5.6 Seibert Lake Trophy Pike Licence

A pilot study to manage Seibert Lake under a special licence scheme that would have a fixed number of licenses issued each year was recommended. Seibert Lake has been a trophy status pike fishery for over 25 years. Special regulations to control harvest have been in place; however, the lake has received excessive fishing pressure and the trophy qualities are not currently being sustained. Implementation of a Seibert Lake Trophy Pike Licence and draw system is scheduled for the year 2001. After the system has been implemented, anglers will be required to enter a licence draw, similar to hunting draws currently held each year. Successful applicants would receive a Seibert Lake Trophy Pike Licence. The lake management plan for Seibert Lake would determine the appropriate number of licenses that could be issued each year.

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